

### Abstract

A method for processing a gas containing at least hydrogen sulfide ( $H_2S$ ) and at least sulfur dioxide ( $SO_2$ ), includes the following stages: contacting the gas with a liquid solvent containing at least one catalyst in a contacting stage, recovering a gaseous effluent substantially containing no hydrogen sulfide and no sulfur dioxide, and a mixture containing liquid sulfur, liquid solvent and solid by-products resulting from the degradation of the catalyst, separating the liquid sulfur from the liquid solvent in a decantation zone, extracting a liquid fraction F containing at least the solid by-products from a layer between the liquid solvent and the liquid sulfur in the decantation zone, sending the liquid fraction F to a processing stage distinct from the contacting stage, and recovering at least a stream  $F_1$  comprising most of the solid by-products and a stream  $F_2$  mostly comprising solvent nearly free of the solid by-products from the processing stage.